

Claims

[c1] A water craft having reduced drag, comprising:

 a bow, a pair of sidewalls disposed in trailing relation to opposite ends of said bow, a stern, a deck and a hull that collectively form said water craft;

 a rigid concavity formed in said hull;

 said rigid concavity having a longitudinal extent that exceeds a transverse extent thereof;

 said rigid concavity having a forward end near said bow and a rearward end forwardly of said stern so that air flows into said rigid concavity at said forward end and so that air flows out of said rigid concavity at said rearward end and under said stern as said water craft undergoes forward travel;

 whereby said air in said rigid concavity reduces the drag of the water craft, thereby enabling said water craft to travel faster under its own power and reducing the power required to tow the water craft behind a larger craft, because said air replaces water that would otherwise provide increased drag.

[c2] The water craft of claim 1, further comprising:

 an air scoop mounted on said bow, said air scoop

adapted to collect air when said dinghy is undergoing forward travel and to direct said air into said rigid concavity;
an airflow passageway that extends from a leading end of said air scoop into a leading end of said rigid concavity;
whereby water flowing under said water craft draws air into said airflow passageway and hence into said rigid concavity.

- [c3] The water craft of claim 2, further comprising:
a one-way valve mounted in said airflow passageway to enable airflow into said rigid concavity when said dinghy is in forward motion and to prevent reverse direction air flow so that air flowing in airflow passageway toward said rigid concavity cannot flow in an opposite direction past said one-way valve;
whereby air in said rigid concavity does not flow toward said air scoop when the bow of the dinghy is momentarily lifted from the water when the dinghy is traveling in choppy waters.
- [c4] The water craft of claim 3, further comprising:
a frame for holding a vertically and transversely disposed wire mesh being snugly positioned in said airflow passageway;
a plurality of flexible flaps that depend from a top edge

of said frame;
said flexible flaps being lifted from said wire mesh when air flows through said airflow passageway in a direction from said air scoop toward said rigid concavity;
said flexible flaps being pressed against said wire mesh when air flows from said rigid concavity toward said air scoop;
said flexible flaps in conjunction with said wire mesh forming said one-way valve.

[c5] The water craft of claim 3, further comprising:
a vertically and transversely disposed frame for an imperforate gate being snugly positioned in said airflow passageway;
said imperforate gate being hingedly connected to a top edge of said frame;
said imperforate gate being displaced from a position of repose when air flows through said airflow passageway in a direction from said air scoop toward said rigid concavity;
said imperforate gate returning to said position of repose when air flows from said rigid concavity toward said air scoop;
said imperforate gate forming said one-way valve.

[c6] The water craft of claim 1, further comprising:
a layer of rigid material that overlies said hull and a

lower surface of said bow and sidewalls, said layer of rigid material imparting said rigidity to said rigid concavity and said layer of rigid material extending in integral form from said concavity to respective lower surface of said bow and sidewalls;

an elongate, longitudinally disposed rib secured to an underside of each of said sidewalls in depending relation thereto;

said elongate ribs inhibiting transverse motion of said stern when said water craft is in forward motion.

- [c7] The water craft of claim 2, further comprising:
 - said air scoop having a generally elliptical shape such that a transverse extent thereof is greater than a height extent thereof.
- [c8] The water craft of claim 1, further comprising:
 - a rigid, transversely disposed stern plate mounted to an underside of said hull;
 - said stern plate being positioned forwardly of said transom;
 - said stern plate being angled by a small angle relative to a horizontal plane such that a leading end thereof is slightly elevated relative to a trailing end thereof.
- [c9] The stern plate of claim 8, further comprising:
 - said small angle being about one to two degrees (1-2°)

relative to said horizontal plane.

- [c10] The water craft of claim 1, further comprising:
 - a pair of stern plates hingedly mounted to said water craft at the stern thereof on opposite sides of a motor; control means for varying the angle of said stern plates relative to a horizontal plane; whereby back pressure to air and water flow through said rigid concavity is controlled by controlling the angle of said stern plates, there being reduced back pressure when said stern plates are disposed at a relatively small angle relative to a horizontal plane and there being increased back pressure when said stern plates are disposed at a relatively large angle relative to said horizontal plane; whereby increased back pressure provides increased buoyancy for the water craft.
- [c11] A water craft having reduced drag, comprising:
 - a hull having a rigid concavity formed therein, said rigid concavity having a length greater than a width thereof; and
 - a pair of longitudinally-extending side rails secured to opposite sides of said hull to cooperate with said rigid concavity to at least transiently capture air within said rigid concavity to reduce drag as said water craft moves in a body of water under its own power or in tow.

- [c12] The water craft of claim 11, further comprising:
 - a first stern plate removably mounted to a hull of said water craft in trailing relation to said rigid concavity; whereby air flowing from said rigid concavity is constrained to flow under said first stern plate; and whereby said first stern plate serves to increase the back pressure presented to air and water flowing through said rigid concavity.
- [c13] The water craft of claim 12, further comprising:
 - a second stern plate removably mounted to said first stern plate; whereby air flowing from said rigid concavity is constrained to flow under said first and second stern plates; and whereby said second stern plate serves to increase the back pressure presented to air and water flowing through said rigid concavity relative to the back pressure increase provided by said first stern plate.
- [c14] The water craft of claim 13, further comprising:
 - a third stern plate removably mounted to said second stern plate; whereby air flowing from said rigid concavity is constrained to flow under said first, second, and third stern plates;

whereby said third stern plate serves to increase the back pressure presented to air and water flowing through said rigid concavity relative to the back pressure increase provided by said first and second stern plates.

- [c15] The water craft of claim 14, further comprising:
 - a fourth stern plate removably mounted to said third stern plate; whereby air flowing from said rigid concavity is constrained to flow under said first, second, third and fourth stern plates; whereby said fourth stern plate serves to increase the back pressure presented to air and water flowing through said rigid concavity relative to the back pressure increase provided by said first, second and third stern plates.
- [c16] The water craft of claim 12, further comprising:
 - a leading end of said first stern plate configured to match a curvature of said rigid concavity.
- [c17] The water craft of claim 13, further comprising:
 - a leading end of said second stern plate configured to match a curvature of said first stern plate and said rigid concavity.
- [c18] The water craft of claim 14, further comprising:

a leading end of said third stern plate configured to match a curvature of said first stern plate, said second stern plate, and said rigid concavity.

[c19] The water craft of claim 15, further comprising:
a leading end of said fourth stern plate configured to match a curvature of said first stern plate, said second stern plate, said third stern plate, and said rigid concavity.